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Are Mutillids Scarce? (Hymenoptera: Mutillidae)

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Mutillid wasps are familiar, often brightly colored species that may be seen rapidly running across open or sandy areas. Yet mutillid wasps are rarely observed in large numbers; rather, collectors usually find isolated individuals or small numbers in any given habitat. In the western part of the U.S., mutillids are rarely observed in large numbers. The general acknowledgment that mutillids exist in low population densities is so accepted that the rare occurrences of large numbers of individuals in an area are given special note (Manley and Taber, 1978; Schmidt and Hook, 1979).

The question arises: because many brightly colored mutillid species are readily, yet infrequently, seen, can we safely assume their population densities are low? Our present observations indicate that mutillid wasps may not be as scarce as generally believed.

In the course of ecological and population studies of the bee *Diadasia rinconis rinconis* Cockerell (Anthophoridae) 90 × 90 cm emergence traps were placed April 13, 1985 over a nesting aggregation located northwest of Tucson, Arizona. The traps were monitored until May 14 for emergence of hosts and parasites (13 *D. rinconis,* 5 Bombyliidae, 3 *Anthidium* bees [Megachilidae], and 1 rhipiphorid beetle were trapped) and then left until August 6, 1985. At that date the three traps contained the following mutillid wasps: trap 1, 77 male *Dasymutilla foxi* (Cockerell); trap 2, 6 male and 1 female *D. foxi*; trap 3, 8 male *D. foxi* and 1 male *D. vestita* (Lepeletier). These findings confirm that *D. rinconis* is a host of *D. foxi* and suggest it is a possible host of *D. vestita* (see Krombein et al., 1979 for host records).

Based on these three traps we can estimate the numbers of parasitic mutillids produced by this nesting aggregation of *D. rinconis.* The traps catch at most only one-half of the mutillid wasps produced—the males (92 males to 1 female caught). The apterous, fossorial females appear to crawl or dig under the trap rims and escape. Thus, 2.4 m^2 of this cactus bee nesting aggregation produced approximately 184 mutillids, or 76 individuals per m^2. The average nesting density of this *D. rinconis* nesting aggregation is estimated to be approximately 25 nests/m^2 (Buchmann, unpubl.) and based on an average of 7.0 cells/nest (E. Ordway, unpubl.) we estimate a cell density of 175/m^2. The nesting aggregation covered an estimated 446 m^2 and therefore produced approximately 78,000 cells. If our survey was representative, 34,000, or 43%, of these cells were parasitized by mutillid wasps.

The above figures are remarkable not only because of their magnitude, but also because in six years of investigating *D. rinconis* we have never seen a *D. foxi* in a nesting aggregation. *D. foxi* is not rare by comparison with other Mutillidae and was at least once recorded in large numbers (Manley and Taber, 1978). This suggests either the species is active at times other than when we are present, or

that a vast percentage of the population simply is behaviorally cryptic. We suggest that both factors are probably involved, but that the second is more important than might be anticipated.

Supportive evidence that mutillid wasp populations may be higher than generally perceived comes from ultraviolet (u.v.) light trap data. Neither male nor female individuals of nocturnal mutillid species are captured by routine collecting activities such as searching ground and soil litter, and turning over rocks. Moreover, nocturnal seaching with head lamps almost never results in finding female nocturnal Mutillidae. However, in spite of their apparent rarity by these collecting methods, male nocturnal mutillids are exceedingly abundant at u.v. lights. Based on our preliminary emergence trap data and on u.v. light observations we suggest that mutillid populations are likely much higher than usually believed and that these species are highly successful and ecologically important parasites of many species of Hymenoptera.

Literature Cited

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